Change in Sezual Behavior of Bulls Asaoxiated with Mating Experience

Tohoku Journal of Agricultural Research
Vol. 34, No. 1, 2 December 1983
Printed in Japan

Change in Sexual Behavior of Bulls Associated with Mating Experience

Hiroshi SASADA, Min-Soo KANG, Akira NIHEI*,
Minoru OHTA* and Junji MASAKI

*Department of Animal Science, Faculty of Agriculture, Tohoku University, Sendai and *Tohoku University Farm, Narugomachi, Miyagiken, Japan*

(Received, July 31, 1983)

Summary

The effects of the mating experience on a pasture mating system were observed for two successive years. In the first year, a bull without mating experience tried to mount vigorously, but could not ejaculate. In the second year, the same bull mated with four estrous cows, suggesting that the mating experience of a bull is important in the pasture mating system.

Observations of the mating behavior of cattle have indicated that a bull chooses his partner in a regular sequence from a group of estrous cows (1–4). However, frequencies of mounting and ejaculation by a bull were different between individuals (1, 2); the older bull tended to mate more cows even if the behavior was not so active.

In this study, effects of the experience of pasture mating on sexual behavior and reproductive efficiency were examined using the same bulls for two successive years.

Materials and Methods

Two bulls and cows and heifers of Japanese Black (A) and Shorthorn (B) breeds reared in Tohoku University Farm were used. At the beginning of the experiments, ages of bulls were fifteen and sixteen months, respectively (Table 1). In the first year, each bull was introduced into an independent pasture and a paddock (11 m×14 m) with cows in estrus of the same breed. In the second year, they were grouped with four estrous heifers. Heifers were treated with 500 μg cloprostenol twice at an interval of 10 days to synchronize estrus. Well-synchronized eight (4A and 4B) of forty-six cows in estrus were used for observation 49 h after the 2nd injection. Observations of the sexual behavior were made for 5 h and were recorded by use of a video (SONY HVC-F1).

TABLE 1. *Composition of Cattle*

Bull	Time of experiments	Age (months)	Ratio (♂ : ♀ in estrus)	Place of observations
A (Japanese Black)	July, 1981	15 to 16	—	pasture & paddock
	August, 1982	29 to 30	1: 4	paddock
B (Japanese Shorthorn)	July, 1981	16	—	pasture & paddock
	August, 1982	30	1: 4	paddock

Results and Discussion

In the first year, Bull A mounted a total of 153 times, vigorously trying to mount to any cattle, regardless of sex, age, and stage of estrous cycle, but was not able to ejaculate in even an estrous animal. Then, he was introduced into a paddock (11 m×14 m) with two estrous cows, but could not ejaculate, although mounting behavior was vigorous. Finally, the bull was introduced to a passway with estrous cows and succeeded in ejaculating. Afterwards, he was released to the paddock and ejaculated in the cow by himself. As a result, Bull A mounted 155 times, including 2 ejaculations.

In the case of Bull B, he revealed searching-behavior and flehmen, but did not mount any cattle. Subsequently, he was allowed to be together with two estrous cows in the paddock, but did not reveal sexual behavior at all. The two bulls were kept on each pasture with a group of grazing cattle for two months and had enough mating experience.

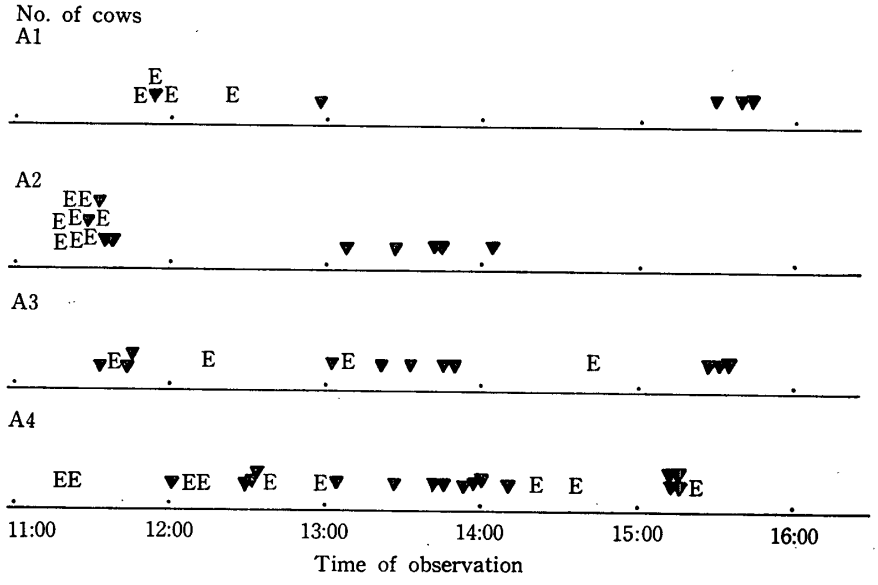

FIG. 1. The pattern of mating behavior of Bull A

In the second year, each of the two bulls was grouped with four estrous heifers synchronized with injections of $PGF_{2\alpha}$ analogue. They ejaculated in their four estrous heifers in a regular sequence during the observation; the order of partners was likely to be determined according to timing of the occurrence of estrus in the animals (Fig. 1 and 2). In total, Bull A mounted 41 times and ejaculated 25 times in 5 h. In contrast, Bull B recorded 12 mounts and 17 ejaculations. These results revealed that the ratios of No. of mountings/No. of ejaculations in Bull A and B were 2.64 and 1.65, respectively (Table 2).

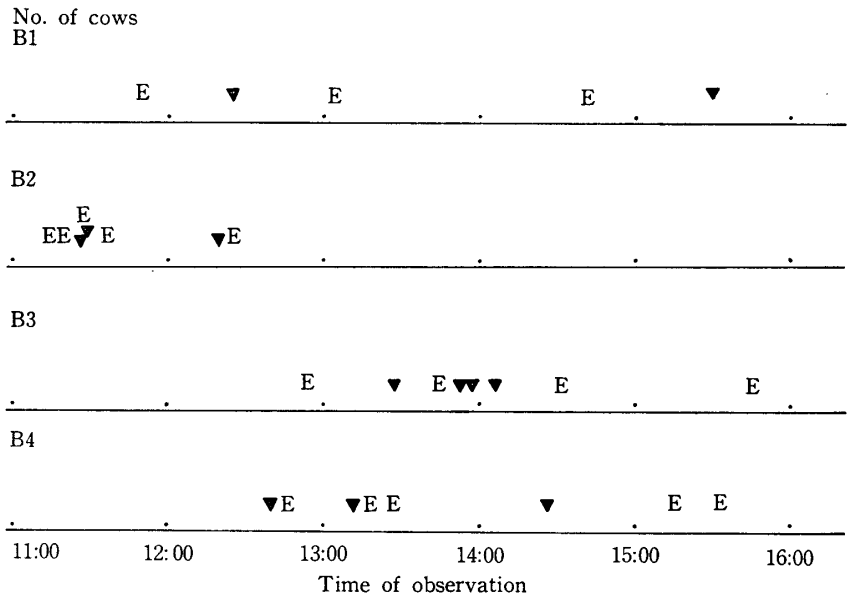

FIG. 2. The pattern of mating behavior of Bull B

TABLE 2. *Sexual activities of bulls in the first and the second years*

Bull	Year	No.*1 of mountings		No. of ejaculations		Ratio*2
		Total	Per cow	Total	Per cow	
A	First	155 (17) *3	9.12	2 (1) *3	2	77.5
	Second	66 (4)	16.5	25 (4)	6.25	2.64
B	First	0	—	0	—	—
	Second	29 (4)	7.25	17 (4)	4.25	1.65

*1 Includes No. of ejaculations
*2 No. of mountings/No. of ejaculations
*3 No. in parenthesis indicates No. of cows which received mounting or ejaculation.

We have observed that by use of ten to fifteen estrous cows synchronized with $PGF_{2\alpha}$ analogue, a bull with abundant mating experience mounted and ejaculated in turn with estrous cows, while a bull with short experience randomly mounted and

ejaculated (1, 2, 5). In the present study, a bull without experience tried to mount vigorously, but never ejaculated, resulting in the lower efficiency of mounting/ejaculation. In the second year, however, the same bull mated with four estrous cows, suggesting the mating experience was important. The present data suggest that the more mating experience a bull has the more efficiently he mounts and ejaculates in numerous estrous cows in a pasture mating system.

This work was supported in part by a grant from the Ministry of Education (No. 56440015).

References

1) Ohta, M., Masaki, J., Sasada, H., Wada, R. and Nihei, A., *Jap. J. Zootech. Sci.* **50**, 235 (1979)
2) Sasada, H., Masaki, J., Wada, R., Ohta, M. and Nihei, A., *Jap. J. Anim. Reprod.* **25**, 198 (1979)
3) Umezu, M., Masaki, J., Sasada, H. and Ohta, M., *J. Reprod. Fert.* **63**, 467 (1981)
4) Masaki, J., Ohta, M. and Hayashi, K., *Jap. J. Zootech. Sci.* **52**, 572 (1981)
5) Sasada, H., Kan, M., Masaki, J., Ohta, M. and Nihei, A., *Tohoku J. Zootech. Sci.* **31**, 14 (1981)